

PRODUCT DATA

Wideband Ear Simulator for Telephonometry Type 4195

Wideband Ear Simulator for Telephonometry Type 4195 is designed for realistic telephone receive response measurements. The design is based on the specifications in the standard ITU-T Recommendation P.57, Artificial Ear Type 3.2 low- and high-leak.

The two grades of well-defined leakage make it possible to simulate the average real-ear loss for telephone handsets that are held either comfortably tight (low-leak pinna) or loosely (high-leak pinna) against the human ear.

The ear simulator is recommended for measurements on supra-aural and supra-concha earphones, both sealed and unsealed, practically covering all kinds of earphone design. The ear simulator can be used for wideband telephonometry in the frequency range 100 Hz to 8 kHz.

Type 4195 has been developed for use in combination with Telephone Test Head Type 4602-B and Mouth Simulator Type 4227.



Uses and Features

Uses

- Development and conformance testing of all types of telephone handsets using Telephone Test Head Type 4602-B
- Realistic measurement of telephone receive response

Features

- Design based on ITU-T Rec. P.57, Type 3.2 low-leak and high-leak simplified pinna simulators
- Includes IEC 60318-4 (formerly IEC 711)-compliant coupler with 1/2" microphone and preamplifier
- Individual calibration according to ITU-T Rec. P.57: supplied with acoustic impedance and frequency sensitivity response measurements

Description

Fig. 1
Type 4195 fully
assembled



Wideband Ear Simulator for Telephonometry Type 4195 supplements Ear Simulator for Telephonometry Type 4185, which conforms to the IEC 60318–1 standard.

Type 4195 offers improved performance at both the low and the high end of the frequency range (up to 8.0kHz), making it suitable for measurements on wideband telephones. This performance is obtained using a simplified pinna simulator, which adds an ear-canal extension and a cavity to the IEC 60318–4-compliant coupler. The cavity has carefully controlled leakage to the exterior (opening selectable in two grades).

This design has been adopted as an option to the European CTR8 Standard for ISDN handset telephones and is implemented in the new wideband recommendations within ETSI and ITU–T.

The ear simulator is equipped with Soft Seal YJ-0892 to ensure a good seal between the coupler and handset surfaces, and to protect the latter from being scratched when mounting the handset for testing.

All relevant calibration data are supplied on both a calibration chart and a calibration data disk. The data are stored both in a text file format (ASCII format) suitable for import to common spreadsheets and in the (legacy) binary data format of Audio Analyzer Type 2012.

Assembly

Soft Seal YJ-0892 is attached to the simplified pinna simulator. The IEC 60318–4-compliant coupler is screwed into the simplified pinna simulator, and Microphone Preamplifier Type 2669 is screwed into the IEC 60318–4-compliant coupler, which contains a ½" microphone. This assembly is shown in Fig. 2.

Fig. 2
Left to right: Soft Seal,
Simplified Pinna
Simulator (low- or
high-leak),
IEC 60318–4-
compliant coupler
and Microphone
Preamplifier Type 2669



Low- and High-leak Pinna Simulators

Wideband Ear Simulator for Telephonometry Type 4195 is a Type 3.2 ear simulator that consists of the ITU–T Type 2/IEC 60318–4 occluded-ear simulator, which connects to an ear-canal extension and is terminated with a pinna simulation device.

Type 4195 provides a realistic acoustic load to telephone handsets under test and reveals acoustic differences between telephone handsets as they appear during real use.

The simplified pinna simulator has a two well-defined leak options from the cavity to the exterior to simulate the average real-ear loss for telephone handsets that are held either comfortably tight (low-leak pinna) or loosely (high-leak pinna) against the human ear.

Type 4195 is recommended for measurements on supra-aural and supra-concha earphones, sealed and unsealed, and for both high and low impedance (covering practically all kinds of earphone design). It can be used in a wide frequency range, from 100 Hz to 8 kHz.

Fig. 3


The two grades of leakage are obtained by using two different pinna simulators. The high-leak pinna (left) has a controlled opening consisting of a number of holes. The low-leak pinna (right) has two very thin precision slits



The Type 4195 ear simulator was made with the anatomically shaped Type 3.3 ear simulator as a reference. The acoustic behaviour of Type 4195 is therefore very close to that of the anatomically shaped pinna simulator. Type 4195 measures at the Drum Reference Point (DRP). By using the individually measured frequency sensitivity responses supplied with the ear simulator, the measurements can be referred to the Ear Reference Point (ERP).

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Compliance with Standards

	CE-mark indicates compliance with: EMC Directive and Low Voltage Directive. C-Tick mark indicates compliance with the EMC requirements of Australia and New Zealand
Safety	EN/IEC 61010-1: Safety requirements for electrical equipment for measurement, control and laboratory use. UL 61010B-1: Standard for Safety – Electrical measuring and test equipment
EMC Emission	EN/IEC 61000-6-3: Generic emission standard for residential, commercial and light industrial environments. CISPR 22: Radio disturbance characteristics of information technology equipment. Class B Limits. FCC Rules, Part 15: Complies with the limits for a Class B digital device.
EMC Immunity	EN/IEC 61000-6-1: Generic standards – Immunity for residential, commercial and light industrial environments. EN/IEC 61326: Electrical equipment for measurement, control and laboratory use – EMC requirements. Note: The above is only guaranteed using accessories listed in this Product Data sheet.
Temperature	IEC 60068-2-1 & IEC 60068-2-2: Environmental Testing. Cold and Dry Heat. Operating Temperature: -5 to +40°C (41 to 104°F) Storage Temperature: -25 to +70°C (-13 to +158°F)
Humidity	IEC 60068-2-78: Damp Heat: 90% RH (non-condensing at 40°C (104°F))
Mechanical	Non-operating: IEC 60068-2-6: Vibration: 0.3 mm, 20 m/s ² , 10–500 Hz IEC 60068-2-27: Shock: 1000 m/s ² IEC 60068-2-29: Bump: 1000 bumps at 250 m/s ²

Specifications – Wideband Ear Simulator for Telephonometry Type 4195

General

STANDARDS

Acoustic performance according to ITU-T Recommendation P.57 section 5.3.2, Type 3.2

DIMENSIONS:

Height: 126 mm (5")

Max. Diameter: 60 mm (2.4")

WEIGHT:

Without Preamplifier Type 2669: 107 g (3.8 oz.)

Environmental Calibration Conditions

Static Pressure: 101.3 ±3.0 kPa

Temperature: 23 ±3°C (73.4 ±5.4°F)

Relative Humidity: 60 ±20%

Ordering Information

Type 4195 Wideband Ear Simulator for Telephonometry includes the following accessories:

- UA-1304: Simplified Pinna Simulator, low-leak
- UA-1448: Simplified Pinna Simulator, high-leak
- UA-1305: IEC 60318–4-compliant Coupler
- YJ-0892: Soft Seal
- ZG-0350: LEMO to 7-pin Brüel & Kjær Adaptor
- Type 2669: ½" Microphone Preamplifier
- AO-0419: Microphone Cable, 3 m (10 ft) LEMO to LEMO
- DP-0939: Calibration Adaptor
- Calibration Charts for low- and high-leak simulators
- Calibration Data Disk

Optional Accessories

Type 4231 Sound Calibrator

Services Available

4195–CFF Factory Standard Calibration

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